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INTEREST, BURNOUT, AND DROP-OUT INTENTIONS AMONG FINNISH AND DANISH HUMANITIES AND SOCIAL SCIENCES PH.D. STUDENTS

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ABSTRACT

Aim/Purpose	This study focused on advancing understanding of individual variations in doctoral students' interest in their doctoral studies and how they related to experiences of burnout and drop-out intentions in Denmark and Finland.
Background	Ph.D. students' experiences of interest, burnout, and dropout intentions among Finnish and Danish Ph.D. students have not been researched before. Research with a person-centred approach exploring individual variations in students undertaking doctoral studies in two comparable but distinct socio-cultural contexts is limited.
Methodology	This study uses exploratory factor analysis, K-means cluster analyses in combination with Pairwise comparisons, ANOVA, and Chi-square test. A total of 365 doctoral students in social sciences and humanities disciplines in Finland and Denmark responded to a <i>Cross-Cultural Doctoral Experience Survey</i> .
Contribution	This study contributes understanding on individual variation in doctoral students' interest across two socio-cultural contexts by identifying four personal interest profiles. The profiles were invariant across the contexts. The study also shed further light on the interrelation between the interest in research and the risk for suffering from burnout and entertaining dropout intentions.

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Findings	The interest profiles identified among the Ph.D. students were the <i>High interest profile</i> , the <i>Moderate interest profile</i> , the <i>Developmental, research and impact interest profile</i> , and the <i>Development and impact interest profile</i> . All interest profiles exhibited high levels of the developmental interest, however they varied especially in the weight given to instrumental and research interests. Ph.D. students in the <i>Moderate interest profile</i> showed signs of burnout, and they were prone to consider dropping out. Also, individuals in the <i>Development and impact interest profile</i> considered more frequently dropping out of their studies.
Recommendations for Practitioners	Investing in the identification and support of interest among Ph.D. students is worthwhile, as interest is not a permanent characteristic of the individual, and the combination of research, development, and impact interest indicates a lower risk for burnout and drop-out intentions.
Recommendations for Researchers	It is possible that interest profiles are the same across the two national contexts investigated in this study, but their underpinnings and premises are different. It is likely that a qualitative approach would shed more light on these foci.
Impact on Society	The results imply that personal interest was not determined by the socio-cultural differences between the countries, indicating that cultivating doctoral students' personal interest, particularly a combination of research, development, and impact, provides a potential buffer for doctoral students' burnout and drop-out, which has been raised as global concerns among policy makers, researchers, and doctoral education developers and administrators during the past decade. The study has impact on doctoral studies in international communities.
Future Research	The results in this study reflect specific characteristics of social sciences and their applied nature. It remains for future research to investigate the extent to which the identified four profiles of interest in relation to burnout and drop-out intentions emerge in the natural sciences.
Keywords	doctoral education, Ph.D. students, interest profiles, burnout, drop-out intentions, cross-cultural comparison

INTRODUCTION

Doctoral students' interest in their study is a core determinant of doctoral studies. It has been shown to play a major role in doctoral study success, the quality of the doctoral experience, and student persistence (Grover, 2007; Pyhältö et al., 2019). High levels of interest have shown to be related to reduced risk for dropping out (Pyhältö et al., 2019), shorter study completion time (Lahenius, 2013), research career intentions (Forbrig, 2020; Hermann et al., 2014), and career trajectory (Grabowsky & Miller, 2015). There is also tentative evidence that interest is related to doctoral students' study well-being or lack of it. Interest in doctoral studies has been shown to be associated to having a joyful experience (Wao & Onwuegbuzie, 2011) and lower levels of experiencing exhaustion and cynicism (Pyhältö et al., 2019). In a previous study on Finnish Ph.D. students in medicine, lack of interest was shown to be related to experiences of poor atmosphere in the learning environment and to stress and exhaustion (Anttila et al., 2015). This implies that personal interest may contribute to the student's risk of developing study burnout.

There is limited research exploring individual variations in students' interest undertaking doctoral studies and scarce evidence of results on the interrelation between interest profiles and the risk for developing burnout and harbouring drop-out intentions in two comparable but distinct socio-cultural contexts. Moreover, so far the majority of prior studies on doctoral students' interest has been small scale qualitative studies (Brailsford, 2010), and hence large-scale qualitative studies and measures to study on doctoral students' interest has been scarce. The aim of this study is to detect the interest

profiles for undertaking doctoral studies among Danish and Finnish doctoral students and whether differences between the two groups can be detected. The study also aims to investigate how the profiles related to students' experiences of exhaustion, cynicism, and drop-out intention.

LITERATURE REVIEW

Personal interest involves both the emotions related to the studies and the importance given to them (Pyhältö et al., 2019). Accordingly, the interest encompasses both emotion- and value-related valence, associated with undertaking doctoral studies, such as involvement or stimulation and the attribution of personal significance or importance (see Hidi & Renniger, 2006; Krapp, 2002, 2005). In this sense, the interest in doctoral studies reflects the alignment between the personal and scholarly activities (Anttila et al., 2015; Sverdlik et al., 2018.). Earlier research on doctoral students' personal interest has either been small-scale qualitative case studies (Brailsford, 2010) or variable-based quantitative studies (Forbrig, 2020; Pyhältö et al., 2019). To our knowledge, there have been no prior cross-country comparisons applying the person-centred approach on doctoral student interest. The objective of a person-centred approach is to “*identify subgroups within a sample of individuals that differ meaningfully with regard to complex systems of variables*” (Meyer et al., 2013, p. 194) and, hence, identify the kinds of interest-profiles doctoral students employ. Scarce research on this topic has resulted in a limited understanding of the individual variation in the interest experienced in pursuing doctoral studies across different socio-cultural contexts and how such experiences are related to doctoral students' risk of developing burnout. We take up the challenge by exploring individual variations in students undertaking doctoral studies in two comparable but distinct socio-cultural contexts, namely, Finland and Denmark.

INTEREST IN DOCTORAL STUDIES

Prior research has shown that doctoral students start and carry out their doctoral studies for a range of intrinsic or extrinsic reasons (Brailsford, 2010). In fact, doctoral students may simultaneously entertain several complementary motives (Guerin et al., 2015). A strong body of evidence implies that doctoral students typically are driven by intrinsic reason such as curiosity to explore, understand, and create new knowledge, i.e., interest in research itself (Guerin et al., 2015; Ministry of Higher Education and Science in Denmark, 2016; Neves, 2018; Pyhältö et al., 2019; Skakni, 2018; Stubb et al., 2012). For example, in a recent large-scale UK survey, 41% of Ph.D. students reported interest in their research topic as the main motive for pursuing a doctoral degree (Neves, 2018). Also, personal and professional transformation and development are often reported as reasons for undertaking doctoral work (Guerin et al., 2015; Skakni, 2018). This includes the desire to refine one's intellectual skills (Skakni, 2018). More instrumental motives, such as future job prospects after completing the doctorate, have also been identified by Ph.D. students. For example, almost one-third (31%) of the doctoral students pointed out that their motive for pursuing a doctoral degree was to improve their career prospects (Neves, 2018). Accordingly, instrumental motives for undertaking doctoral studies, such as getting a better salary or promotions once the degree is completed are also employed (Guerin et al., 2015; Sakurai et al., 2017; Stubb et al., 2012).

Recent research has provided tentative evidence on cross-country differences in doctoral students' interest. A recent variable-based cross-country comparison identified several differences between Spanish, Finnish, and UK doctoral students' interest (Pyhältö et al., 2019). While Spanish students sustained higher levels of researcher and instrumental interest compared to either UK or Finnish students, Finnish students displayed the lowest levels of instrumental interest, and UK students combined the lowest level of development interest with the highest level of cynicism. Further, the interest was a determinant of experiencing exhaustion, cynicism, study satisfaction, and reduction of the risk of abandonment across the three contexts (Pyhältö et al., 2019). Based on the findings, it can be presumed that differences between the Finnish and the Danish doctoral students in terms of interest may occur.

Doctoral student interest in their doctoral studies has been shown to be affected by multiple socio-cultural and contextual attributes, such as supervisory support and faculty modelling (Lee, 2018; McAlpine, 2017). However, such attributes are always individually experienced and, hence, have a varying impact on doctoral students' interest. Accordingly, the individual experience may potentially result in significant variation in the interest experienced both within and across the socio-cultural contexts. Such variation may even be greater than the impact of socio-cultural differences. Yet, we still know little about individual variation in doctoral students' interest across the different socio-cultural contexts in which the doctoral education is embedded.

BURNOUT AND DROP-OUT INTENTIONS

Doctoral education does not always provide an optimal environment for nurturing a doctoral student's interest or study well-being (Leveque et al., 2017; Reevy & Deason, 2014). Prior research has revealed that doctoral students often experience stress and exhaustion during their doctoral studies (Hermann et al., 2014; Hunter & Divine, 2016; Peltonen et al., 2017). Both Danish and Finnish doctoral students have been reported as experiencing stress and exhaustion during their studies (Cornér et al., 2017; Hermann et al., 2014; Peltonen et al., 2017; Stubb et al., 2011) resulting in increased burnout risk.

Burnout has two distinctive symptoms, namely, exhaustion and cynicism (Bakker et al., 2008; Maslach & Leiter, 2005, 2008). Exhaustion is characterized by a lack of emotional energy and feeling strained and tired of work (Maslach et al., 2001). Cynicism is characterized by losing interest in one's work and perceiving it as meaningless. Cynicism may lead to distancing and reduced involvement (Maslach & Leiter, 2008) and to detached responses to colleagues and other aspects of the work (Maslach, 2003). It has been shown that both exhaustion and cynicism emerge from work overload and is a result of too heavy job demands and social struggle at work (Maslach, 2003). In the context of doctoral education, exhaustion (Anttila et al., 2015) and cynicism may lead to dropping out of the doctoral program (Vekkaila et al., 2016).

Regrettably, a significant number of doctoral students never complete their doctoral studies (Gardner, 2009; Jones, 2013). Based on the findings of previous studies attrition rates can range from 33% to 70% (Gardner & Gopaul, 2012; Ivankova & Stick, 2007; Jiranek, 2010). Also, in the Finnish and Danish context of doctoral education, there is evidence of high drop-out intentions rates (Cornér et al., 2017, 2018). It has been shown that research community integration and networks (Castelló et al., 2017; Graham & Massyn, 2019; Jairam & Kahl, 2012; Lovitts, 2001) are vital for reducing attrition rates and to enhance degree completion.

It is important to gain more knowledge on both personal interest and its relationship with burnout and attrition risk, since all levels in the system gain from doctoral learning environments that cultivate Ph.D. student interest and well-being (Pyhältö et al., 2019). Evidence suggests that interest (Pyhältö et al., 2019), exhaustion, and cynicism among Ph.D. students are associated with the risk of dropping out of the doctoral program (Anttila et al., 2015; Cornér et al., 2017; Vekkaila et al., 2016). The literature review indicates that there is a gap in the research-based knowledge with a person-centred approach to Ph.D. students' interest, burnout, and drop-out intentions in humanities and social sciences in cross-cultural context. We intend to fill this gap and explore individual variation in doctoral students' interest across different socio-cultural contexts.

DOCTORAL EDUCATION IN FINLAND AND DENMARK

Doctoral education in Finland and Denmark is based on common cultural features and a robust tradition of public education, including at the university level. Both Finland and Denmark have implemented the Bologna three-cycle process (Andres et al., 2015; Gudmunsson, 2008). There are no tuition fees (Andres et al., 2015), they are similar in terms of overall publication productivity, and they have weighted citation impacts above the World average (Nordforsk Policy Briefs, 2017). They also

produce comparable numbers of Ph.D. degrees annually (Ministry of Higher Education and Science in Denmark, 2016).

In addition, doctoral education in both Finland and Denmark has undergone major changes in terms of a more competitive environment (Bengtson, 2016; European University Association, 2019). This has involved establishing quality assurance and support systems (Andres et al., 2015), funding opportunities (Ministry of Higher Education and Science in Denmark, 2016; Pyhältö et al., 2015) and increased demands for international cooperation (Finnish Ministry of Education and Culture, 2017; Ministry of Higher Education and Science in Denmark, 2016; Toom & Pyhältö, 2020). The countries also share similar concerns regarding doctoral education, including high drop-out intentions rates (Cornér et al., 2017, 2018) and the need to build a more robust social support system for Ph.D. students (Hermann et al., 2014; The Technical University of Denmark (DTU), 2019; Vekkila et al., 2016).

Both in Finland and Denmark, doctoral students are required to have obtained a Master's degree or equivalent in order to continue to doctoral education (Finnish Ministry of Education and Culture, 2016; Ministry of Higher Education and Science in Denmark, 2013). The institutions decide who is to be admitted as Ph.D. students and the Research board of a doctoral school (Finland) or the Admission committee in the Graduate school (Denmark) assesses the applications (Finnish Ministry of Education and Culture, 2016; Ministry of Higher Education and Science in Denmark, 2013) according to a research plan. The principal supervisor is appointed by the Research board of a doctoral school (in Finland) and the Graduate school (in Denmark). Also, co-supervision practices are applied in both countries. In both Finland and in Denmark, a doctoral dissertation can be completed either in the form of a monograph or as an anthology, meaning a series of articles that includes a summary. In Finland, the article-based dissertation consists of three to five peer-reviewed journal articles (depending on the discipline), and in Denmark it should consist of three to six articles.

However, there are also differences between the countries (Kyvik & Tvede, 1998). Danish doctoral students in Humanities are required to include a long-term and continuous period of research lasting two months (minimum) at an active research environment outside their own institution (Aarhus University, 2012). This is not required in the study programmes in Finnish doctoral schools. Doctoral education in the two countries also differs regarding funding for doctoral students: full-time funding is usually provided for Danish doctoral students, while in Finland funding is not automatically provided (Andres et al., 2015).

AIM AND RESEARCH QUESTIONS

The aim of this research was to explore individual variations in doctoral students' interest in their doctoral studies in the humanities and social sciences in Denmark and Finland. We have explored the interrelation between interest profiles and the risk for developing burnout and harbouring drop-out intentions. The following research questions were addressed:

1. What interest profiles for undertaking doctoral studies can be detected among Danish and Finnish doctoral students? Are there differences in the interest profiles displayed by Danish and Finnish doctoral students?
2. Are the profiles related, and how, to students' experiences of exhaustion and cynicism, and drop-out intention?

METHODS

PARTICIPANTS

A total of 356 Danish and Finnish doctoral students from one research-intensive university in Denmark (n=145) and two research-intensive universities in Finland (n=211) participated in the research.

Due to missing values in some variables, the sample size is slightly smaller in some of the analyses. The mean age of the participants was 36.62 years. The distribution of other demographic data including gender, research group status, thesis form, and study status (full-time/part-time) are presented in Table 1.

Table 1. Participants' gender, research group status, thesis form and study status.

Variables	Full sample (N = 356)		FI (n = 211)		DK (n = 145)	
	N	%	N	%	n	%
Gender						
Women	253	71.9	155	78.7	87	61.7
Men	99	28.1	45	21.3	54	38.3
Research group status						
Mainly on my own	277	78.5	161	76.3	116	81.7
Mainly in a research team or teams	17	4.8	10	4.7	7	4.9
As much on my own as in a research	59	16.7	40	19.0	19	13.4
Thesis form						
Monograph	136	38.9	72	34.4	64	45.7
Summary of articles	198	56.6	131	62.7	67	47.9
I don't know	15	4.3	6	2.9	9	6.4
Study status						
Full-time	229	65.6	107	52.2	122	84.7
Part-time	120	34.4	98	46.4	22	15.3

The data were collected in 2015 through an online survey, which was accessible in Finnish, Swedish, and English. The survey was directed to all registered humanities and social sciences Doctoral students at the three universities. The response rate was 29%.

RESEARCH ETHICS

The research respects the fundamental principles of research integrity in the two countries (ALLEA, 2017; Finnish Advisory Board on Research Integrity, 2012; Ministry of Higher Education and Science in Denmark, 2014). A study like this one, that is conducted with healthy, voluntary adults and that does not pose risks or involve intervention in the physical integrity of the participants, does not require formal ethics review in either context (Finnish Advisory Board on Research Integrity, 2009; Ministry of Higher Education and Science in Denmark, 2014). Participation in the study was voluntary and based on informed consent. The data are anonymous to protect the participants' identities.

MEASURES

Data were collected using the *Cross-Cultural Doctoral Experience Survey* (Pyhältö, Stubb, & Lonka 2009; Pyhältö et al., 2015). The survey was validated with a pilot study, which included 100 doctoral students in educational sciences, before the data collection. In this article, we report data from the *Interest in doctoral studies* and *Burnout* scales. The scale items and reliability coefficients (Cronbach's Alpha) of the scales are reported in Table 2. The *Interest in doctoral studies* scale comprises of four sub-scales (15 items). These are *research interest* (3 items), meaning curiosity to explore and create new knowledge; *instrumental interest* (4 items), meaning opportunity to cultivate one's professional skills and knowledge; *developmental interest* (5 items), meaning utilizing the doctoral degree and earlier studies as a mean to an end, such as getting a better salary or promotion; and *impact interest* (3 items), meaning

doctoral students' interest, and, personal values for contributing to the benefit of the society. The respondents were prompted as follows: to *evaluate the following statements about your interest in doctoral studies. I am doing doctoral studies because...* The items used a seven-point scale, in which 1 = unsatisfied/strongly disagree, 7 = completely satisfied/fully agree. The *Burnout* scale (11 items) included two dimensions, namely *cynicism* about doctoral studies (4 items) and *exhaustion* resulting from doctoral studies (7 items). *Dropout intentions* was measured using a binary item (yes/no).

ANALYSIS

After screening for outliers and normality, a series of exploratory factor analyses (EFA) were conducted using the Maximum Likelihood (ML) extraction method with Promax rotation to determine the underlying structure of the variables measuring interest in doctoral studies and burnout. Results suggested retention of a four-factor solution for interest in doctoral studies and a two-factor solution for the burnout scale (Table 2).

The EFAs were carried out with the full sample and with the two subsamples separately. The factor analyses done with subsamples produced highly similar results as the factor analyses done with the full sample. To examine doctoral students' interest profiles, we performed a series of K-means cluster analyses using the *Interest in doctoral studies* subscale scores as constituting dimensions. Two-, three-, and four-cluster solutions were tested and evaluated, based on both statistical criteria and the theoretical salience of the results. Based on this, a four-cluster solution was selected. Repeating the same procedure using Finnish and Danish subsamples separately confirmed the same solution. Fisher's one-way analysis of variance and Gabriel's, and Games-Howell's test along with Cohen's d were used to investigate the differences between profiles on exhaustion and cynicism. The Chi-square test and Cramer's V were used to examine the differences between the profiles on drop-out intentions.

Table 2. Scales, items, and the alpha values of sum variables representing the factors.

Scales	Factor 1	Factor 2	Factor 3	Factor 4
Interest in doctoral studies (*four-factor solution, KMO=.79; Bartlett's test $p < .001$)				
F1: <i>Instrumental interest</i> (4 items; eigenvalue=4.19; alpha=.81)				
I want to get a better salary.	.80			
I want to get a better position.	.79			
My job prospects are better after doctoral degree.	.64			
Degree is required in my future work.	.56			
F2: <i>Research interest</i> (3 items; eigenvalue=2.23; alpha=.78)				
After graduating, I want to get a post-doc at a university.		.81		
I want to work in a research community.		.79		
I am inspired by the work as researcher.		.54		
F3: <i>Developmental interest</i> (5 items; eigenvalue=1.84, alpha=.65)				
I want to develop my skills.			.60	
Finding out new things is fascinating.			.59	
I want to develop myself.			.62	
I enjoy intellectual challenges.			.39	
I want to complete what I started.			.38	
F4: <i>Impact interest</i> (3 items; eigenvalue=1.19; alpha=.62)				
My research is useful for others.				.73
I am inspired by my research topic.				.56
I want to contribute to my field of research.				.53

Scales	Factor 1	Factor 2	Factor 3	Factor 4
Burnout (*two-factor solution, KMO=.90; Bartlett's test $p < .001$)				
F1: <i>Exhaustion</i> (7 items, eigenvalue=5.42, alpha=.86)				
I brood over matters related to doctoral research a lot during my free time.	.79			
I often sleep badly because of matters related to my doctoral research.	.74			
I feel overwhelmed by the workload of my doctoral research.	.66			
The pressure of my doctoral dissertation causes me problems in my close relationships with others.	.66			
I feel burnt out.	.64			
I often feel that I fail at my doctoral research.	.54			
I often have feelings of inadequacy in my doctoral research.	.48			
F2: <i>Cynicism</i> (4 items, eigenvalue=1.48, alpha=.84)				
I have difficulties in finding any meaning to my doctoral dissertation.		.94		
I feel my doctoral dissertation is useless.		.90		
I feel that I am losing interest in my doctoral research.		.79		
I used to have higher expectations of my doctoral research than I do now.		.50		

* ML factoring with Promax rotation was used.

RESULTS

DOCTORAL STUDENTS' INTEREST PROFILES AND DIFFERENCES IN THE INTEREST PROFILES BETWEEN THE FINNISH AND DANISH DOCTORAL STUDENTS

Four distinctive doctoral student interest profiles were detected (Figure 1). The first one was the *High interest* profile. It was the most common profile among the doctoral students, comprising 36.9% ($n = 123$) of the sample. Doctoral students displaying this profile reported high average value on all interest subscale scores. The second profile, the *Moderate interest* profile, was displayed by one quarter (25.7%, $n = 88$) of the doctoral students. The students with this profile presented moderate levels on all interest subscale scores, except on the developmental interest level, where they displayed high levels. The third profile resulting from our analysis was the *Development, research and impact interest* profile (21.3%, $n = 73$). The doctoral students displaying this profile experienced high levels of developmental, research and impact interest, but only moderate level of instrumental interest. The *Development and impact interest* profile included the smallest number of respondents (17.0%, $n = 58$). The High development and impact interest group displayed relatively high levels of both developmental and impact interest, while having only a moderate level of research interest and a low amount of instrumental interest. As our previous notion that the K-means cluster analysis did not produce essentially different results in the Finnish and Danish subsamples, we found no statistically significant differences between Finnish and Danish doctoral students on cluster memberships.

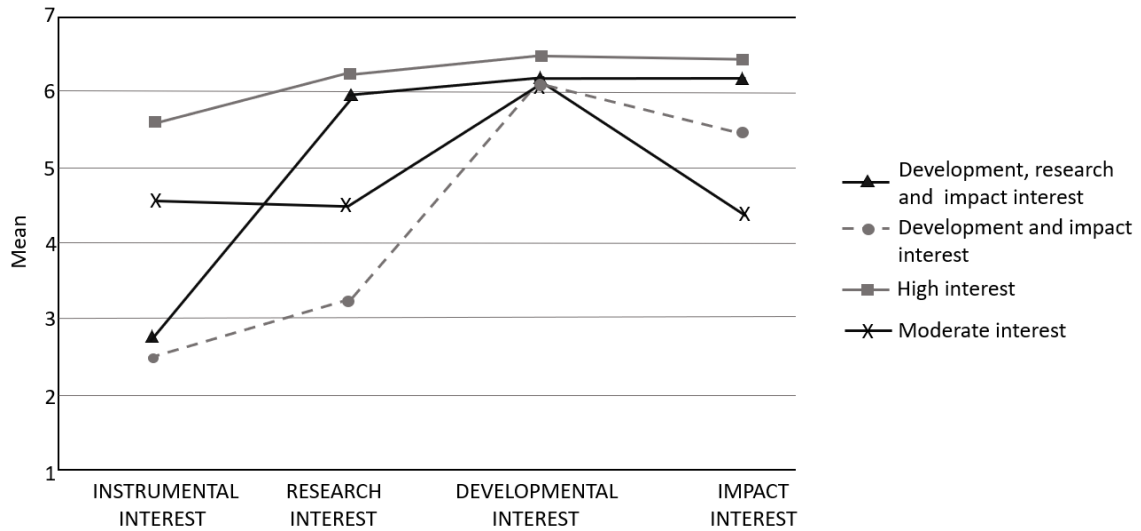


Figure 1. Interest profiles of doctoral students

THE RELATIONSHIP BETWEEN THE PROFILES AND THE STUDENTS' EXPERIENCES OF BURNOUT AND DROP-OUT INTENTIONS

Means and standard deviations of profiles on the burnout subscales are presented in Table 3.

Table 3. The means and standard deviations of profiles on the burnout subscales

	Development, research and impact interest (n = 73)		Development and impact interest (n = 58)		High interest (n = 123)		Moderate interest (n = 88)		
Variables	M	SD	M	SD	M	SD	M	SD	F
Exhaustion	3.08	1.28	3.53	1.44	3.33	1.44	3.81	1.29	3.98**
Cynicism	2.06	1.08	2.95	1.66	2.20	1.29	3.31	1.37	16.61***

*p < .05, **p < .01 ***p < .001

Pairwise comparisons done with Gabriel's test indicated that the differences in the profiles' display of exhaustion appeared only between those in the *Development, research and impact interest profile* and the *Moderate interest profile* ($p < .01$, $d = .23$) with the members of the *Moderate interest profile* holders suffering more from exhaustion. As for cynicism, the Games-Howell test revealed that the differences were statistically significant between the *Development, research and impact interest profile* and the *Development and impact interest profile* ($p < .01$, $d = .64$), between the *Development, research and impact interest profile* and the *Moderate interest profile* ($p < .001$, $d = 1.01$), between the *Development and impact interest profile* and the *High interest profile* ($p < .05$, $d = .50$) and between the *High interest profile* and the *Moderate interest profile* ($p < .001$, $d = .83$). The members of the *Moderate interest profile* reported more cynicism than the members of the *High interest profile*. In average, the members of the *Development, research and impact interest profile* expressed the least amount of cynicism. The profile membership also had a statistically significant relationship with drop-out intentions (Table 4).

The members of the first and third profiles, *Development, research and impact interest* and the *High interest*, were least likely to harbour thoughts about dropping out, whereas the members of the *Development and impact interest* and the *Moderate interest profile* reported drop-out intentions more frequently (Table 4). The differences were statistically significant.

Table 4. Profile membership and doctoral students' drop-out intentions

Profile	Drop-out intentions	
	Yes	No
Development, research and impact interest (n = 73)	10 (13.9%)	62 (86.1%)
Development and impact interest (n = 58)	30 (52.6%)	27 (47.4%)
High interest (n = 123)	24 (20.0%)	96 (80.0%)
Moderate interest (n = 88)	33 (39.8%)	50 (60.2%)
$\chi^2(3, 332) = 32.68, p < .001, \text{Cramer's } V = .31$		

DISCUSSION

Prior research involving cross-country comparison on doctoral student interest have been variable based (see Pyhältö et al., 2019). To our knowledge, this is the first study identifying doctoral students' individual interest profiles across two countries. We identified four distinct interest profiles among doctoral students. While all exhibited high levels of the developmental interest, they varied especially in the weight given to the instrumental and research interests. Two of the profiles exhibited consistently a high or moderate interest, while two profiles, namely the *Development, research and impact interest* profile and the *Development and impact interest* profile, indicated a low interest in the instrumental dimension. In these two profiles, the developmental interest was high. Development and professional transformation have been identified in earlier research as central motives for undertaking doctoral studies (Guerin et al., 2015; Skakni, 2018). The result on the developmental aspect of the willingness to refine one's intellectual skills while undertaking doctoral studies is also in line with current literature (Skakni, 2018).

However, the two profiles detected differed in research interest. It appears that in the *Development, research and impact interest* profile, there is a strong commitment to conducting research and this entails an inherent value for the students representing this profile. Prior research has identified interest in research itself as a core driver for those undertaking doctoral studies (Guerin et al., 2015; Neves, 2018; Pyhältö et al., 2019; Skakni, 2018; Stubb et al., 2012). The role of research may be more instrumental for students representing the *Development and impact interest* profile. Research for these students may be more of a means to an end, such as self-development or societal benefit, rather than an activity cherished in itself.

The study shows that students in two of the profiles are more prone to considering dropping out, one of them being the *Development and impact interest* profile. A lack of inherent interest in the research itself appears to be an exposing factor for considerations to drop out. When the research is not progressing according to plans or the process feels heavy, the research activity may not be sufficient to help individuals in this profile group to persevere especially if achieving the greater goal is not yet in sight. This result corroborates earlier research implying that interest in doctoral studies reveals association between scholarly and personal actions (Anttila et al., 2015; Sverdlik et al., 2018). Similarly, considering dropping out was also more frequent in the *Moderate interest* profile, in which the members indicated overall lower scores on interest in doctoral studies than the other profiles. Individuals in the *Moderate interest* profile were also more prone to exhaustion and cynicism than other profiles. Prior research on doctoral students (Cornér et al., 2017; Peltonen et al., 2017; Vekkaila et al., 2016) has identified a relationship between cynicism and dropping out. In light of this, it is not surprising that

members of this profile considered dropping out of doctoral studies more frequently, and also indicated the highest level of burnout-related attributes. While research shows that a strong interest in research and developmental aspects appear to be a buffer against burnout (see also Pyhältö et al., 2019), it is noteworthy, that in the *Moderate interest* profile the scores on the different interest dimensions are by no means low, only moderate or average. Individuals with the *Moderate interest profile* is clearly more vulnerable to burnout than the other profiles. Understanding buffering factors may help to identify how students with this profile can be supported at critical points in their progress. Sometimes dropping out may be the best option, but this should be preceded by thorough analysis of the situation and contributing factors and a reflective dialogue mapping out directions and solutions. The result emphasizes the importance of interest in the successful doctoral study career (Forbrig, 2020; Grover, 2007; Lahenius, 2013). While it may be possible to complete prior study stages with lesser levels of interest, at the doctoral study level this is no longer possible. It is important that aspiring doctoral students are aware of this difference between prior studies and doctoral level studies and the expectations it poses on interest.

Our results confirm earlier research stating that how Ph.D. students tackle their tasks and perform during their doctoral studies is partly reliant on their background and their personal motives for undertaking their study (Martinsuo & Turkulainen, 2011; Nummenmaa et al., 2008). Advisors and supervisors are in a key position in ensuring that doctoral students begin their doctoral journey with a realistic understanding of the increasingly high demands and expected premises for doctoral studies. Research has emphasized the crucial role of the supervisor (Hunter & Divine, 2016; Martinsuo & Turkulainen, 2011) and his/her alertness and sensitivity of the Ph.D. student (Gurr, 2001).

The profile structure does differ from the results in prior research (Pyhältö et al., 2019) on doctoral students' interest. Instead of three previously identified types, this study identified four profiles. The *Development and impact interest* profile has not previously been identified in prior research, which may reflect the field of the respondents in this study. All respondents were doctoral students in the humanities and the social sciences. Especially in social sciences, there is often a strong applied component making the proximity of these fields to societal relevance or impact closer than in some other fields (Kyriacou & Coulthard, 2000; Löfström et al., 2010). To illustrate this, students who choose the field of education do so predominantly because they consider teaching to be a socially important job, and they hope to contribute to society and to children's learning (Kyriacou & Coulthard, 2000; Löfström et al., 2010). The results showed that the Finnish and Danish students did not differ from each other with regards to profiles suggesting that the profiles are not socio-culturally dependent. The profiles are sufficiently robust to capture doctoral student interest across contexts. The result indicates that variations within contexts are greater than between the two national contexts.

The result in this study can be understood in terms of similarities in common cultural structures, a robust tradition in public higher education benefits (no tuition fees) and similar requirements for doctoral education (Andres et al., 2015; Finnish Ministry of Education and Culture, 2017; Gudmunsson, 2008; Ministry of Higher Education and Science in Denmark, 2016). Yet, our results differ from the findings of Pyhältö and her colleagues (2019) showing several differences between Finnish, Spanish, and UK Ph.D. students interest profiles. Prior research has established that doctoral student interest in doctoral studies is influenced by socio-cultural and contextual attributes (Lee, 2018; McAlpine, 2017). The results of our study suggest that the individual's *interpretation* of the social and cultural characteristics of the study context may play a greater role in shaping the doctoral experience and related attributes than the socio-cultural context in itself. Simultaneously, research suggests that doctoral students may experience different challenges that arise from national differences in doctoral education and career options (Pyhältö et al., 2019). Hence, it is possible that interest profiles are the same across the two national contexts investigated in this study, but their underpinnings and premises are different. It is likely that a qualitative approach would shed more light on this question, and we propose that there be future research to investigate this.

CONCLUSION

This study focused on advancing understanding of individual variation among 356 Finnish and Danish Ph.D. students' interest in their doctoral studies and its' relation to experiences of burnout and drop-out intentions in humanities and social sciences. The interest profiles identified among the Ph.D. students were the *High interest profile*, the *Moderate interest profile*, the *Developmental, research and impact interest profile*, and the *Development and impact interest profile*. All interest profiles exhibited high levels of developmental interest, however they varied especially in the weight given to the instrumental and research interests. Ph.D. students in the *Moderate interest profile* showed symptoms of burnout and they were prone to consider dropping out. Also, individuals in the *Development and impact interest profile* considered more frequently dropping out of their studies.

The study highlights the need for further research into field-specific differences. While our judgement is that the results reflect specific characteristics of social sciences and their applied nature, it remains for future research to investigate the extent to which the now identified four profiles emerge in the natural sciences. The *Moderate interest profile* warrants further investigation. Understanding the delicate composition of various dimensions of interest may also help aspiring doctoral candidates and their potential supervisors to consider the premises for doing a doctorate. Finally, while this study has contributed by identifying doctoral study interest profiles, it triggers the need to investigate the stability of individual profile membership over time. For this purpose, longitudinal studies will be necessary. There are methodological limitations in the study. The sample may not be representative of the population of doctoral students in the two countries. The reliabilities of two interest factors, namely Impact interest and Developmental interest were below .70, which can be considered to reflect questionable reliability (see Gliem & Gliem, 2003). These factors should be interpreted with caution, and they warrant refinement in further research. Furthermore, it is possible that students who struggle to maintain interest or feel stressed refrain from answering surveys as these may be experienced as an additional burden. This would give an over-optimistic view of interest levels in the profiles. It could even lead to failure to identify the most negatively disposed profile(s).

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